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frontiers

managing public lands for multiple use

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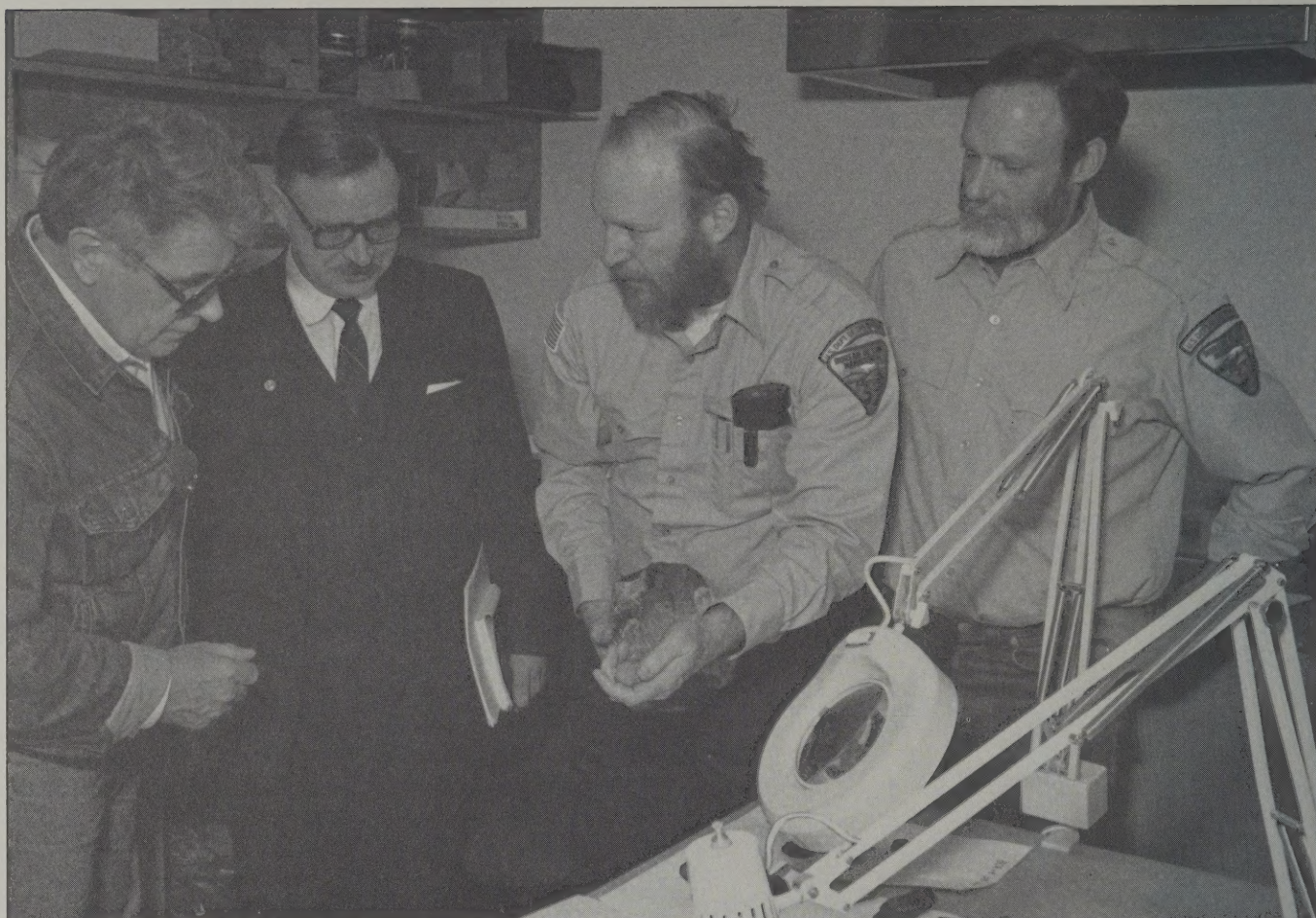
Tracking fish to their winter holes



BLM fisheries biologist Brian Lubinski checks the receiver before flying over the Beaver Creek drainage to monitor radio signals from migrating fish. He has implanted transmitters in 20 arctic grayling to learn where they go and what kind of winter habitat they choose.

Obsidian:

Volcanic glass artifacts offer means of tracing man's migrations to Alaska



Dr. John Cook, BLM Arctic District archaeologist (third from left), shows an obsidian boulder and artifacts from Alaskan sites to visiting Russian professors Lozhkin and Myasnikov (left). Cook and BLM archaeologist Mike Kunz hope to obtain samples of Russian obsidians. They already know that the stone in some artifacts came from Russia. With enough samples, they may be able to unfold the story of man's arrival in the new world, both before and after the land bridge existed.

The Russian scientist peered intently at an arrowhead of smoke-colored volcanic glass, running his finger over its jagged edge. The table in front of him was strewn with flakes and cobbles of obsidian, grouped according to the place where they had been found.

"Very interesting," he said in strongly accented English. His companion nodded, looked at a map showing archaeological sites in Alaska and Russia, and commented in Russian.

The two were in Fairbanks visiting BLM archaeologists Dr. John Cook and Mike Kunz to learn about their obsidian hydration research project.

Kunz, the Steese/White Mountains District archaeologist, and Cook, the Arctic District archaeologist, had obtained a three-year grant from BLM in 1991 to refine and test the use of obsidian for dating archaeological sites in northern and interior Alaska.

This research may expand worldwide knowledge of the migration and trade routes of prehistoric people who populated the arctic region.

Obsidian is natural glass of volcanic origin. "Ancient humans made stone tools such as scrapers, projectile points and knives from obsidian," Kunz said, "so we find obsidian flakes and artifacts at many archaeological sites." In fact, it has been found in about half of the 2,000 archaeological sites inventoried on public lands managed by BLM in its three northern districts.

Sharper than steel, obsidian blades are used today for certain kinds of

surgery, so it's no surprise that the sharpest projectile points and knives made by prehistoric people were of obsidian.

This rock has two other characteristics that enable scientists to tell how old an artifact is and where it was quarried.

Absorbs moisture

The first characteristic is that a freshly chipped surface of obsidian begins to absorb moisture from its surroundings and continues to absorb it at a known rate. So scientists can figure out when an artifact was made by measuring the amount of moisture (or hydration) in the stone.

How fast it absorbs water depends on local soil temperature and the chemical composition of the obsidian. Since the rate is specific to the location, Cook and Kunz are determining those rates for selected locations in Alaska.

"We expect to find obsidian from 10,000 years ago, when the Bering Land Bridge existed, up to the present," says Cook.

Trace elements tell where it came from

The other useful characteristic of obsidian, Cook says, is that "each piece has its own identity, which we can find by analyzing its trace elements. Each suite of trace elements is specific to an individual obsidian source," Cook added. "Once we've identified that source location, any piece of obsidian from that source can be recognized, no matter where it is found."

Several pieces of obsidian found at Alaskan archaeological sites have already been identified by Cook as coming from Siberia.

Now he and Kunz are interested in obtaining more obsidian source samples from the Russian scientists so they can pinpoint the origin of other exotic samples that are found in Alaskan archaeological sites. Finding exotic obsidians of different ages would indicate that early arctic residents traveled and traded between Siberia and Alaska both during and after the existence of the Bering Land Bridge.

The Russian scientists who may be able to make this international interchange of information have now made the first step by visiting the BLM archeologists in Fairbanks. Geoclimatologist Anatoly Lozhkin is Chief of Quaternary Geology and Geochronology Labs at the North East Interdisciplinary Research Institute in the city of Magadan. His institute is under the umbrella of the Far Eastern Branch of the Russian Academy of Science.

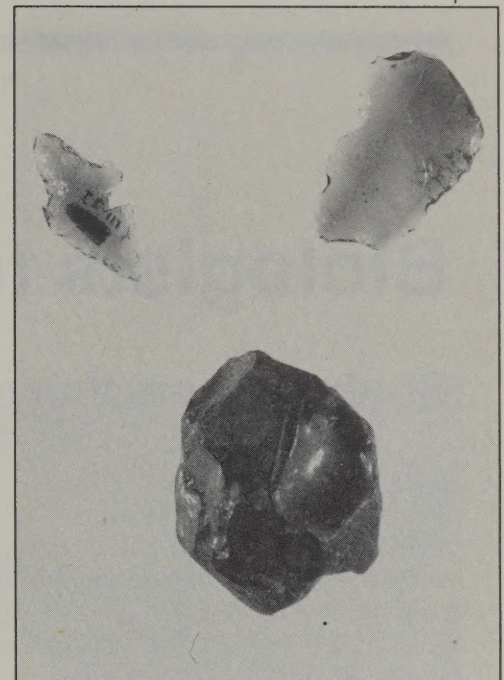
Professor Veniamin Myasnikov is a mathematician and Vice President of the Far East Branch of the Russian Academy of Science, with responsibilities for international cooperative research projects.

The two visited Fairbanks as part of a fact-finding mission concerning possible cooperative projects between American and Russian scientists. Lozhkin acted as English interpreter for Myasnikov, but he was shy about his linguistic ability. "I never studied English formally," he said as he struggled to translate scientific terms. Dr. Lozhkin has been working on global climate change, and has previously traveled to Alaska to take core samples from arctic and subarctic lakes on a project with Dr. Patricia Anderson of the University of Washington. "BLM-Alaska has provided logistical support and equipment, as well as local expertise to Dr. Anderson and her Russian associates over the years," said Mike Kunz, "and their global change research has contributed immensely to our knowledge of past environments in Northern Alaska."

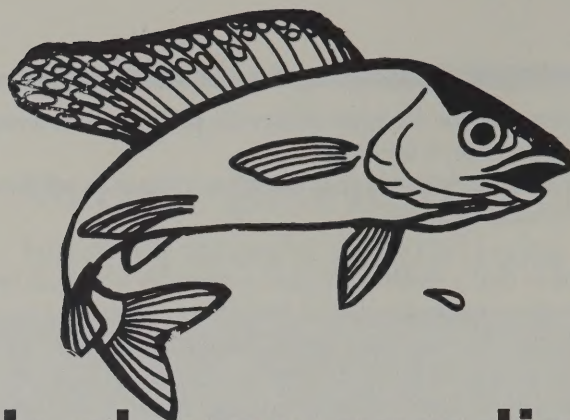
Lozhkin said, "I think we have made some valuable contacts here that will open doors to future cooperative studies that will benefit both our countries.

The presence of the obsidian means that the BLM archeologists can date those sites and develop a regional chronological system that will reveal more about how prehistoric man arrived in Alaska and how he lived.

—Sharon Durgan Wilson/
Jane Mangus



Ancient toolmakers chipped obsidian flakes (upper right) off of a cobbles (bottom). The chips were then refined into tools like this arrowhead (upper left). Obsidian can be clear, red, green, brown or black; thin pieces of this natural glass are translucent.



Biologists track clever grayling with tra

Studying how fish survive arctic winters

Although fish must be exceptionally hardy creatures to survive in northern Alaska's arctic winters, they are sensitive to their surroundings. They balance precariously between life and death, and the slightest change in one natural condition—water temperature, oxygen levels, amount of food—can spell doom for a fish population.

Overwintering habitats are not only crucial to the survival of interior fishes, they are the least understood.

The BLM's Steese/White Mountains District has begun a project that will identify and quantify fish overwintering areas in the White Mountains National Recreation Area.

In gathering the data, District fisheries biologist Brian Lubinski is using radio telemetry to track fish movements and habitat selection.

"This past fall we surgically implanted radio transmitters into 20 arctic grayling in the Beaver Creek drainage in Interior Alaska," Lubinski said. "Using airplanes last fall and this winter, we aerially tracked the grayling as they migrated downstream and selected overwintering habitat."

The next step is collecting information on the physical, chemical and biological characteristics of those habitats the fish selected.

"We are now traveling by snow machine to conduct ground surveys. Using a combination of aerial

photography and other technology, we map and quantify the overwintering areas."

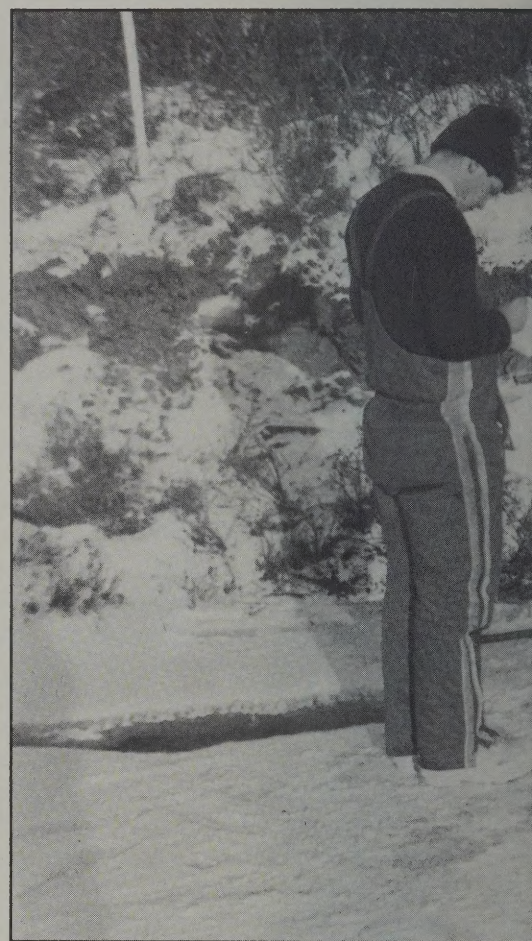
This involves measuring the habitat area and the quality, velocity and discharge of its water. Lubinski also samples the fish community to see how many species are present. Then he classifies the stream channel according to a standard BLM system.

Aerial photography is later used to further define the physical environment of the preferred stream reach.

They will also explore the feasibility of using channel classification, physical parameters, water quality, hydrology, or a combination of the four to predict a stream's potential as overwintering habitat. If the method works in the Beaver Creek drainage, Lubinski plans to broaden its application by testing it in the Birch Creek drainage within the Steese National Conservation Area.

The project offers several benefits, says Lubinski. "Foremost is the information we will gain on the overwintering habitat requirements and migration patterns of Beaver Creek arctic grayling."

Lubinski's work also adds information to a statewide data base now being collected with information about fish and aquatic habitat on the lands BLM manages. Dennis Tol, BLM State Office



Graduate student Nicholas Hughes records water biologist Brian Lubinski calls out the measurement of a winter as part of a cooperative project between

fisheries biologist, is coordinating the development of this data base.

Lubinski hopes the method will be usable in other areas where environmental conditions are similar to those of the Beaver Creek drainage. "Ultimately, we hope to develop the means of predicting the

Transmitters and planes



Depth and aufeis formation in Twelvemile Creek as
Data are being collected several times this
and the University of Alaska-Fairbanks.

overwintering habitat potential for areas outside of the Steese/White Mountains District," he said.

Since BLM is responsible for maintaining and improving habitat for fish, establishing a data base of fishery and habitat information is a top priority. "I'm developing a data

base so future information can be compared with today's information to determine if crucial fish habitats are being adequately protected or improved."

—Sharon Durgan Wilson



Jon Jozifek assists biologist Brian Lubinski as he sutures the incision after placing a radio transmitter in the body cavity of an arctic grayling. The radio signals will be used to track the migration movements of the fish.

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Alaska

What images appear in your mind when that name is mentioned? Wide open land filled with towering mountains and rushing rivers? Winter sports of dogsledding or skjoring?

Within this vast land of beauty and resources, what part does BLM play?

If you were to list one of the valuable minerals BLM manages on federal land in Alaska, would it be gold? You'd be right, of course, but there are other aspects of BLM-Alaska that don't readily meet the eye.

If the outline of the state of Alaska, from the Aleutian Island Chain in the west to Ketchikan in the southeast, were to be superimposed onto the map of the continental United States, it would stretch across the entire country, from California to South Carolina. This largest of all states boasts a total of 367.7 million acres. As of September, 1991, BLM-Alaska manages 91,600,000 acres.

Within these BLM lands are 6 wild and scenic rivers totaling more than 952 miles. They are Beaver Creek, Birch Creek, Delta River, Fortymile River, Gulkana River, and Unalakleet River. These rivers offer all classes of recreation from white water adventures to quiet fishing.

Alaska's long snowy winters provide an exciting playground for sports enthusiasts. Cross-country skiers, dogsleders, skjorers, snowshoers and snowmachiners have long enjoyed the trails and resources on BLM lands. In the million-acre White Mountain National Recreational Area there are

public cabins available for those enthusiasts up to the journey to get there. They will be rewarded for their efforts when viewing the breath-taking scenery provided by their remote location. Contact BLM-Steese/White Mountains District for more details.

All totaled, there are 29,566 active federal mining claims in Alaska as of January 1991. These include 28,989 lode and placer claims, and 577 mill and tunnel sites. Of these, BLM has jurisdiction over half of the mining claims and administrative

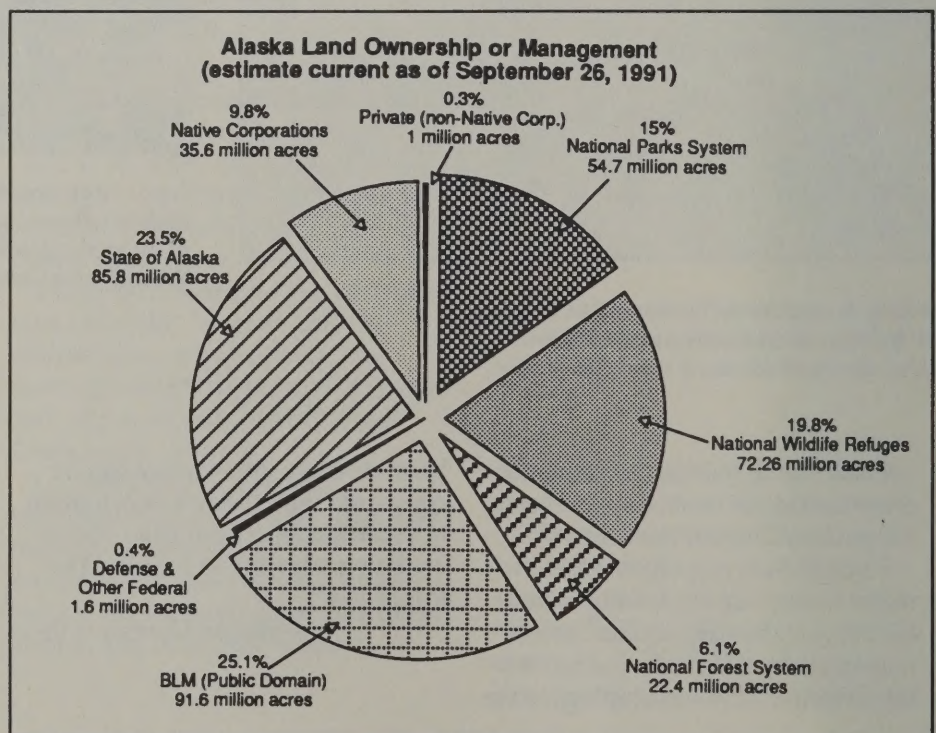
responsibility for all filings.

Incidentally, although gold holds the lure of riches, zinc was the most valuable non-fuel mineral produced in the state of Alaska in 1990. Alaska was ranked as first among the 50 states producing zinc. Gold held second place, and silver third. The Red Dog Mine southwest of the National Petroleum Reserve-Alaska may be the world's largest producer of zinc in 1991.

The resources of BLM-Alaska are vast. One valuable and precious resource, however, is not provided by the land itself. It is provided by the people. It is themselves. In 1991, 272 volunteers from Alaska and across the country donated over 40,000 hours of labor working on various projects from office work to maintaining campgrounds and trail maintenance, including the famous Iditarod. These helpful hands confirm that our country's greatest asset is its people.

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—Pam Eldridge
*Pam Eldridge is a volunteer working in BLM's
Alaska State Public Affair Office*



Trails, cabins ready for spring recreation in White Mountains



Moose Creek Cabin, 16 miles east of Elliott Highway, provides a cozy stop on trail.

Are the winter doldrums and cabin fever dragging you down? Are you tired of fighting crowds on ski trails or snowmachine routes?

Well, the Bureau of Land Management manages a million-acre public playground of unrivaled beauty, just 50 road miles north of Fairbanks.

Since 1985 the Steese/White District has expanded the winter trails

from 20 miles to 200 miles and the number of cabins from one to nine. These picturesque log cabins are available by reservation for \$20 a night. Each is in a secluded, scenic spot and is equipped with a wood heating stove, a white gas cook stove, a lantern, table, benches and bunks. There is an outhouse near each cabin. Cabin fees are reinvested in the cabin program.

BLM has just published a new brochure that may entice you to try out this area. The booklet is titled *White Mountains National Recreation Area Winter Trails and Cabins*. It has a large map showing the topography, highway access points, trails and cabins.

The text gives information on the amenities available and how to prepare for winter outings.

Trailheads on the Elliott Highway have now been improved with trail directional signs, information kiosks, better parking and posts to tie up dog teams.

"Public support has been overwhelming," says District Manager Roger Bolstad, "and the using public's sense of pride in ownership has virtually eliminated vandalism."

In the past two years the number of visitors has quadrupled.

The White Mountains National Recreation Area is the only national recreation area in Alaska and the only one managed by BLM.

—Sharon Durgan Wilson

—New exhibit goes up in Nome —



Some people just think of gold when they think of Nome and just think of mining when they think of BLM. A new exhibit at BLM's Nome office shows the many other resources BLM manages in that part of Alaska.

frontier flashes

BLM-Alaska is one of the sponsors of the **Alaska Biodiversity Conference** coming up March 24 to 26 in Anchorage. Theme of the conference is "Maintaining the Integrity of Alaska's Ecosystems: What is involved?" Dr. Wade Davis, ethnobotanist, will give a pre-conference public lecture March 23 on "Our Global Legacy—the Values of Biodiversity."

BLM has issued a "minimum-impact" permit allowing Coppo of Los Angeles to film a new **Ruffles Light Potato Chips** commercial on public land near Glennallen. Does that mean they promise nobody involved will gain weight?

At a **Village Land Planners Meeting** put on by the **Bering Straits Native Corporation** in December, four BLM representatives explained the conveyance process, public easements, and how to understand land conveyance documents.

Bering Straits Corporation Resource Development Specialist Thomas Sparks said, "The corporation

appreciates all the cooperation we have had from BLM. They have done an excellent job of reaching out to our village corporations on an issue that is essential to our corporate survival as well as our cultural survival—land."

BLM State Director Ed Spang and Alaska State Pipeline Coordinator Jerry Brossia gave opening remarks at an open house for the **Joint Pipeline Office** in January. More than 100 people attended, representing federal, state and private agencies from across Alaska. Exhibits showed pipe rust control, oil spill clean-up equipment, and overall activities on the Trans-Alaska Pipeline. A video explained the pipeline "pig," which detects pipe corrosion electronically.

The Joint Pipeline Office (formerly the Joint Federal/State Pipeline Monitoring Office) is unique—the only joint federal-state office in the nation. Federal and Alaska state agencies work together as one body to monitor pipeline activities, from regular maintenance to emergency oil spill actions.

Housed in this office is a public library with 5,000 books and 57 file

cabinets full of federal and state technical information, reports and maps dealing with all aspects of the pipeline.

The Joint Pipeline Office is open Monday through Friday 8 a.m. to 4:30 p.m. Phone (907) 278-8594.

The **Alaska Army National Guard** held an exercise involving 150 local guardsmen and 31 snowmachines on the **Iditarod National Historic Trail** in February. BLM issued the Guard a temporary-use permit for the eight-day "seek and observe" exercise between Unalakleet and Kaltag, and sent two Anchorage District employees out to inspect the trail before the event.



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